United States Patent [19]

Palmiter et al.

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[54] **CONTROL OF DNA SEQUENCE TRANSCRIPTION**

[75] Inventors: **Richard D. Palmiter**, Seattle, Wash.; **Ralph L. Brinster**, Gladwyne, Pa.

[73] Assignee: **University Patents, Inc.**, Westport, Conn.

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[52] **U.S. Cl.** **435/172.3**; 435/68; 435/194; 435/240; 435/317; 935/6; 935/34; 935/36; 935/53; 935/70; 935/111

[58] **Field of Search** 435/172, 240, 241, 317, 435/172.3; 536/27; 936/43, 56, 27, 34, 36; 935/6, 34, 36

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Primary Examiner—Alvin E. Tanenholtz

Attorney, Agent, or Firm—Marshall, O'Toole, Gerstein, Murray & Bicknell

[57] **ABSTRACT**

The transcription of DNA sequences in living cells is subjected to external regulation by incorporation of promoter/regulator DNA sequences responsive to metals and/or steroids. More particularly, regulation of the transcription of selected exogenous DNA sequences incorporated into eukaryotic host cells is facilitated by operative association (e.g., fusion) of the selected sequence to a promoter/regulator DNA sequence which is positively or negatively responsive to environmental variation in the concentration of heavy metal ions and-/or steroid hormones. As an example, a structural gene for thymidine kinase from herpes simplex virus, fused to the promoter/regulator DNA sequence of a mouse metallothionein-I gene and incorporated on a suitable DNA plasmid vector, is introduced into mouse embryos and stably incorporated therein. Gene expression in differentiated cells of adult mice resulting from the embryos is subsequently regulatable by administration of heavy metals such as cadmium or steroid hormones such as the glucocorticoid, dexamethasone.

4 Claims, 1 Drawing Figure